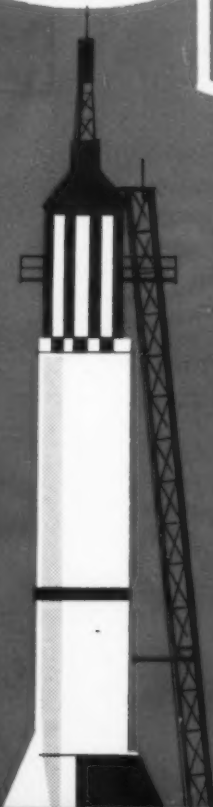


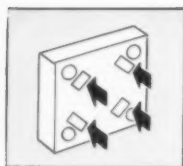


# DIE CASTING ENGINEER

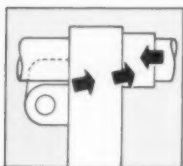
PUBLICATION OF THE SOCIETY OF DIE CASTING ENGINEERS / SEPTEMBER 1961



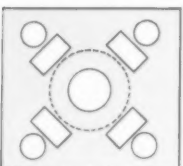
*Start Countdown - -*



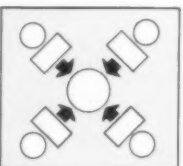
1. Each corner link is a strong, self-contained support for both plate and die.



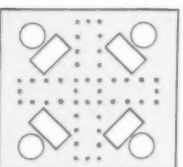
2. Short and direct transfer of loads on each corner minimizes bending stresses on the moving die platen and back plate.



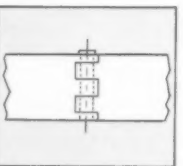
3. Reduces the area of unsupported moving die plate. Helps eliminate flashing and potential cracking of dies.



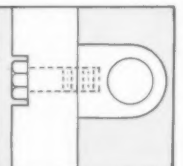
4. Prevents weaving of the link center axis (crosshead) and consequent unequal loading.



5. Permits a large area of both horizontal and vertical bumper pin ejection pattern.



6. Corner positioning of each link assembly results in equal and straight line loading of all pins and bearings in the link pivots.



7. Toggle anchors are bolted to the back and traveling platens. They are not subject to weld breaks or breakage as part of a casting.

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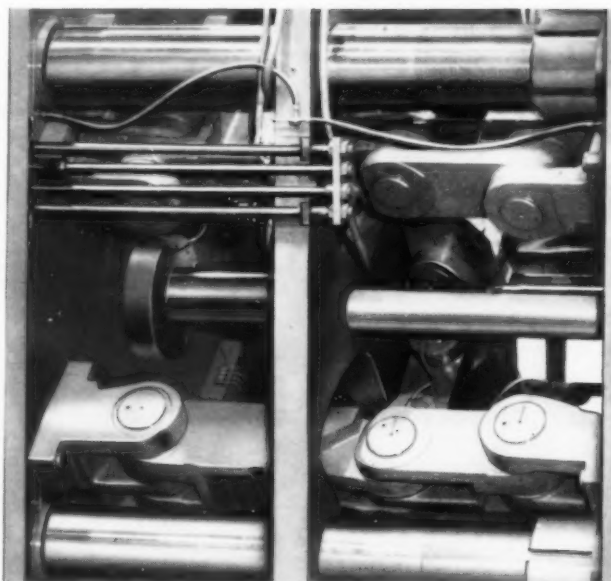
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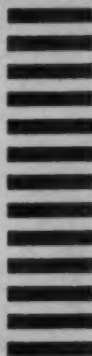
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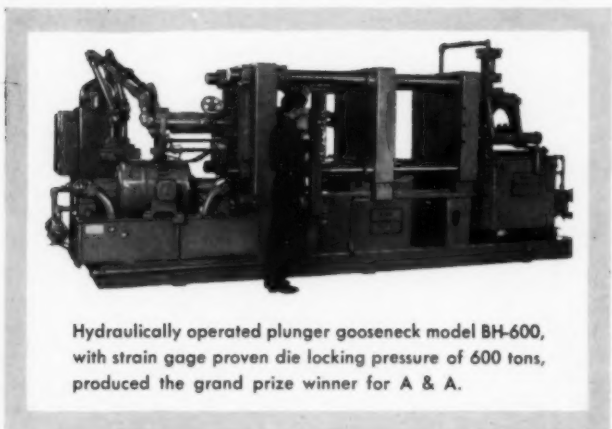
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DIE CASTING ENGINEER

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# DIE CASTING ENGINEER

THE SOCIETY OF DIE  
CASTING ENGINEERS, INC.



VOL. 5 NO. 5  
SEPTEMBER 1961

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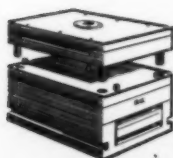
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John L. MacLaren

## PRESIDENT'S REPORT

**A**S THIS issue coincides with the normal fall renewal of our Society activities at the chapter level, I would like to make use of the opportunity to develop three major points which seem to me to be of particular importance at this time to the die casters and suppliers who form the backbone of the Society of Die Casting Engineers.

Of primary significance to us all is the Second National Die Casting Exposition and Congress scheduled

for Cobo Hall in Detroit, September 25 to 28, 1962. The first Show, held last November, was successful from virtually every point of view, and of great value to those who participated. We intend to insure that the second Show is even better than the first. I am confident that David Tann, whose acceptance of the post of General Chairman of the Exposition and Congress (announced elsewhere in this publication) is the man to guarantee that this objective will be met.

Secondly, let us consider the role of the Society in the die casting industry. I know you will agree that, for an industry to be strong, the technical organization representing it must be strong. The Society requires your active support to the limit of your capacity. We particularly need to build up our membership to be able financially to initiate the program the industry needs so vitally.

On this page there is a satirical piece on "Ten Ways to Kill an Organization." Although its tone is humorous, the points all refer to little sins of omission and commission of which every one of us is guilty from time to time. Let us see if we can each avoid these shortcomings during the year ahead.

My third point really has no business appearing in a technical publication, but I feel should be highlighted as it affects the livelihood of us all, supplier as well as die caster. This is the almost disastrous amount of price fighting currently prevalent in the jobbing die casting industry. When price battles become as serious as they appear to be at the present time, little or no profit is made. Without profits, a company cannot maintain a modern plant and develop new products and new business. Business is lost, companies go broke, die casting engineers lose their jobs and either must relocate or enter other industries, suppliers lose orders, and eventually the customer for castings himself suffers because his sources are unable financially to offer improvements.

Reasonable reductions in prices based on the economics of the cost picture are the staff of life of our competitive system. However, to engage in *unreasonable* price competition, without regard for actual costs, is to engage in a war *nobody* wins. If the die

(Continued on Inside Back Cover)

### TEN WAYS TO KILL AN ORGANIZATION

*(Editor's Note. With the return to the regular monthly meeting schedules in Chapter areas, we think it appropriate to remind SDCE members that their organization is only as strong as they themselves make it. The following list of important "do's" and "don't's" if heeded in the negative sense, should help us all to build a bigger and better Society.)*

1. Don't go to any of the meetings, but if you do go—go late.
2. Always find fault with the work of the officers and members.
3. Never accept an office. It is much easier to criticize than to do things.
4. Get sore if you are not appointed on a committee. If you should be appointed, don't attend any of the committee meetings.
5. If asked to give your opinion on some matter, tell the Chairman you have nothing to say. After the meeting tell everyone how it should be done.
6. Do nothing more than is absolutely necessary. When others roll up their sleeves and willingly and unselfishly use their ability to help matters along, howl that the organization is run by a clique.
7. Hold your dues back as long as possible or don't pay them at all.
8. Make no effort to get new members.
9. Don't be sociable either within or outside of the meetings.
10. If you should get a good idea—smother it at once, before it does some good.





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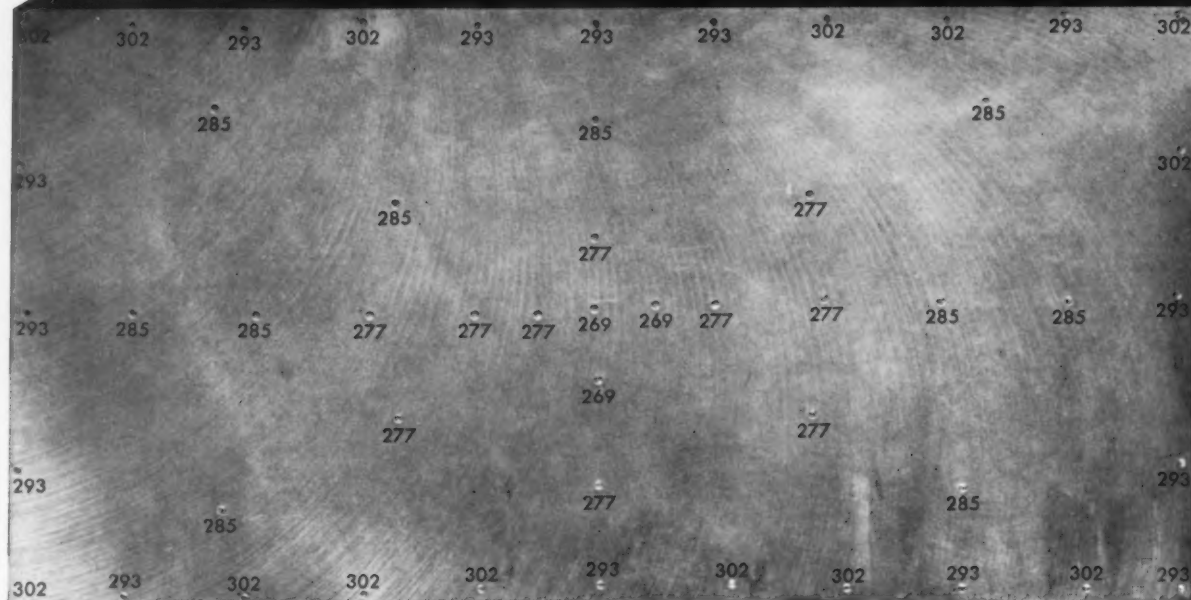
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For further information on higher hardness, **DENSIFIED** CSM 2 and NU-DIE V® (H-13) mold and die steels, call your local Crucible steel service center. *Crucible Steel Company of America, Four Gateway Center, P.O. Box 88, Pittsburgh 30, Pennsylvania.*

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# THE CONTRACT DIE SHOP

*By Helmut A. Gebhardt*

**T**HE dies and other tooling used by the die casting industry are built either by captive die shops in the die caster's plant, or in many cases by contract or "job shops." It is the purpose of this paper to discuss the services which a job shop offers to the die caster.

The cost of a die is the total of its design, building and maintenance costs. A progressive modern die shop will provide those functions and facilities, including sales, estimating, engineering and production, which are necessary to produce dies that have the lowest total cost per casting produced.

## SALES

**A**LMOST all job die shops are in the "small business" category. Often the selling is done by the general manager or an engineer, but frequently by the shop owner himself. Men of this caliber are not "order takers." They are eager to use their experience and skill for the mutual benefit of the die caster and his customers. They can often provide design recommendations as well as on-the-spot cost estimates.

## ESTIMATING

**L**ABOR hours represent from 75 per cent to 90 per cent of the cost of a die. Estimating the time required to build a die is not an exact science, but rather an art based on wide spread experience in die construction. The estimator must rely upon his knowledge of the diemaker's art to evaluate the time needed for various machine and bench operations. When the cost of a die is estimated from a part drawing, rather than from a finished die design, the estimator must

be able to visualize each die component. He must "build the die in his head."

A good die shop will have reliable time records of completed jobs. These records are used as an estimating tool. By comparing similar jobs the estimator can verify his judgment.

The total hours of shop and engineering time required is then applied to the rate per hour on a selling price basis. As rates may vary for certain equipment, the services of a qualified accountant should be used in their determination.

The cost of heat treating, die steels and other materials are comparatively easy to estimate with reasonably accuracy.

## ENGINEERING

**H**AVING received an order to design and build a die casting die, the engineering department goes to work. A consultation with the customer is important at this point. Cooperation between the die designer and the product engineer may result in improvements in the casting or in cost savings. This consultation should also result in an agreement as to the type of die required to meet the production requirements.

A good die designer will study the casting to determine the best location for parting lines, inserts, side core pulls, ejectors, etc. While determining these various factors to suit good die making practice, he must also keep in mind the requirements of trim dies and future machining operations. A die designed to produce a casting which can be trimmed and cleaned economically is not necessarily the cheapest die to build.

Proper specifications for the die steels and their heat treatment are the responsibility of the die designer. He must also determine the proper size and proportions for all die components. To design a weak,

---

*Mr. Helmut A. Gebhardt is President and General Manager of the Alliance Mold Company, Inc., of Rochester, New York, and a National Director of the Society of Die Casting Engineers.*



An impression for a zinc automotive part being duplicated on a Hydrotel.

poorly proportioned die is poor economy. Likewise an over-designed die is more costly than necessary.

How much detail should be included in the design? Ideally, dies are built from designs showing in complete detail every component, but, on the other hand, dies are frequently constructed simply by reference to a marked-up part drawing. Die design drawings should be a record of all features agreed upon during previous consultation. They are also a means of communicating all necessary specifications to the diemaker in the shop. The diemaker should be operating machines, not pencils; the location of inserts, ejectors, size and location of gates, overflows and water lines are much too important to be left to his discretion. Thus, all impressions, slides, inserts and cores should be detailed, showing shrinkage dimensions, draft angles, ejector pins and water channels. The type of steel, its heat treatment and surface finish requirements should also be specified for each component.

The assembly drawings should show the retainer blocks and ejector system details. Mounting holes, bar clearance and clamp slots to suit the die caster's equipment should also be shown on the assembly drawings.

#### PRODUCTION

**A** MODERN, progressive die shop has two things to sell. One is the skilled workmanship of its personnel, the other is the use of its specialized machine tool equipment. These two factors complement each other.

The diemaker working in a job shop usually is a highly skilled man who takes pride in the work he produces. He probably has had experience with a greater variety of work than his brother diemaker in the captive shop. He is aware of the fact that his employer's reputation and through it, his own future welfare, depend on the quality and quantity of work he produces.

The managements of many job shops constantly strive to improve the available skills through apprenticeship training programs, and by a sustained effort to provide steady work for their employees. During slow periods they may carry some or all of their skilled people to insure that the necessary skills will be available when business improves. Needless to say, this cuts heavily into profits.

(Continued on Page 10)



A skilled hand engraver finishing an impression for an aluminum die casting die.

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# REED-PRENTICE DIE CASTING NEWSLETTER

## AUTOMATIC OPERATION ...what's in it for you?

Up until now, automatic operation in die casting has been largely limited to the smaller (100-200-ton) high-speed machines. While ideally suited to the very long production runs found in the automotive and appliance industries, automatic equipment does lack the flexibility for ready adaptation to a variety of jobs, and often requires more complicated dies.

However, the advantages it offers far outweigh these considerations. Automatic operation gives you the same conditions on every shot. Your operating cycle is shortened; your efficiency improved. And, once set and running, one man can tend several machines, with a resultant saving in labor costs.

### What Is Involved?

Automation . . . automatic die casting . . . requires four key points.

- (1) The machine must be equipped with a method of low pressure die closing. This is a vital safety factor, and protects the mold if a piece of the casting should not be completely ejected.
- (2) Some form of automatic sweeping is needed between shots. This will blow off the die faces after opening to remove pieces, chips, etc. It can also be used to spray lubricant over the face on its return stroke.
- (3) The die caster must be designed for

automatic cycling with its gate closed.

- (4) A method must be provided for removing pieces from the machine area.

### What's New?

With many die casters showing an increasing interest in automatic operation, the question of "What's New?" comes up again and again. Reed-Prentice engineers have some surprising answers to this question . . . in 400-ton hot and cold chamber machines designed to handle completely automatic operation or any degree of it.

Each REED will be completely equipped to operate with automatic ladling, lubrication of die and plunger, program coring, and ejection. A newly designed drop-through base will permit castings to fall clear and enable users to hook up to an automatic conveyor system.

### Speed and Capacity

These units will have faster die strokes, high operating pressures and short cycles. Both motor horsepower and pumping capacity are stepped up to handle the operating speed. Pipes will be sized to take the volume needed, and manifolded wherever possible.

Past performance of the REED cross-head and link system in numerous field installations shows that it gives the positive mechanical locking pressure needed

for automatic operation and is easy to maintain. This system will be kept on the new machines.

### No More Guesswork

One very important feature of these new units will be the accuracy of adjustment that will be possible. No more guesswork will be involved. On the shot end, you will be able to adjust hydraulic pressure, slow starts, fast fill and high squeeze. These same adjustments may be reset day after day, with the same degree of accuracy.

Die plates are being laid out with SDCE standards. The knockout pins are SDCE pattern, plus a generous carry-over of the old pattern. Thus any die presently being operated on a REED will be good on the new machine, too.

On the zinc machine, an automatic gas shut-off mechanism will be available as an option. This safety feature will operate if the flame goes out.

### More Information

These are some of the major features die casters can expect to find in the new REEDs that are now available. If you'd like to know more, just contact your REED Sales Engineer. He can tell you about other advantages of the new 400-ton hot and cold chamber units, and about their use for automatic die casting.

In addition, he'll have some early development news on a new 600-ton REED, also built with an eye to automatic operation, which is scheduled for introduction soon. Why not call him today, or write us direct for information.

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September, 1961

9

Besides the usual tool room equipment, a good die shop must have available many specialized machine tools. Rotary head milling machines, Kellers or Hydrotel duplicators, pantograph engraving machines and spotting presses represent a considerable investment. This equipment is necessary so the diemaker can do his work efficiently without resorting to make-shift methods.

Electrical discharge machining is one of the new developments being employed by some shops. This equipment can be a real time saver when used to produce configurations which are difficult to machine by conventional means. Metal removal rate is slow as compared to milling or turning, so it is not a cure all. However, its use in a die shop is further evidence that the management is taking advantage of all available cost cutting equipment.

#### JOB vs. CAPTIVE DIE SHOP

**W**E MAY ask ourselves the question—Are not all these services also provided by the captive shop? Certainly they are, to some extent. However,



Electrical discharge machine in operation.

it is our belief that using the services of a job shop offers some economic advantages.

Wage rates paid by job shops are in some cases higher than those paid by captive shops. Substantial overtime cost is often an additional expense. To compete successfully there must be substantial cost savings in other aspects of job shop operation.

We believe that these higher wage rates are offset by a higher degree of skill and greater productivity of job shop employees. The relatively small size of a job shop operation encourages close identification of

the employee with the success and growth of the company for which he works.

A significant cost advantage characteristic of the job shop is its lower overhead rate. This rate may range from 70 per cent to 130 per cent of direct labor cost. Comparable rates for captive shops appear to be in the range of 250 to 400 per cent.

The job die shop must make its profit from die work. It has no other products or operating depart-



Cores for a die casting die being duplicated on a pantograph engraving machine.

ments in which to bury costs. Therefore, a fair comparison of captive shop costs must include full overhead cost plus a reasonable return on the investment in facilities.

By using the services of a job die shop the die caster can reduce his capital investment requirement, or he can use available capital to improve his production facilities. Considerable working capital may be released because dies are not paid for until delivered to the die caster.

A further advantage is the elimination of certain risks which exist in die building. The price of a die becomes final once the bid of a die shop is accepted. Thus the job shop assumes the financial risk of production errors, heat treating troubles, and underestimating of shop time.

In conclusion, we would urge all die casters to acquaint themselves with services and facilities available in the job die shop industry. Whatever your requirements may be, we are confident that you will find a job shop that has the skill and equipment to meet them efficiently and economically.

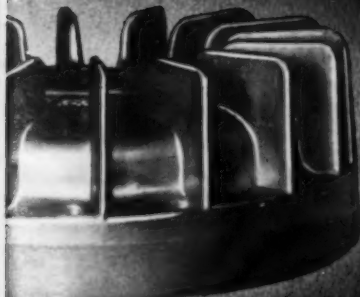
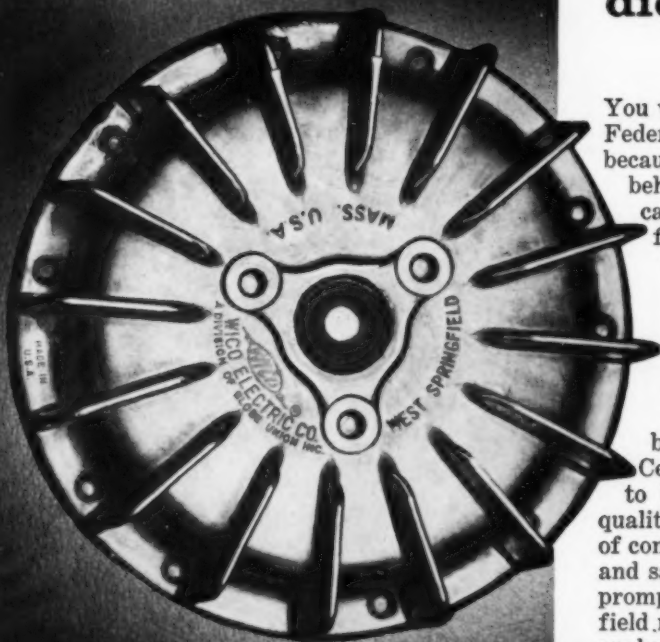
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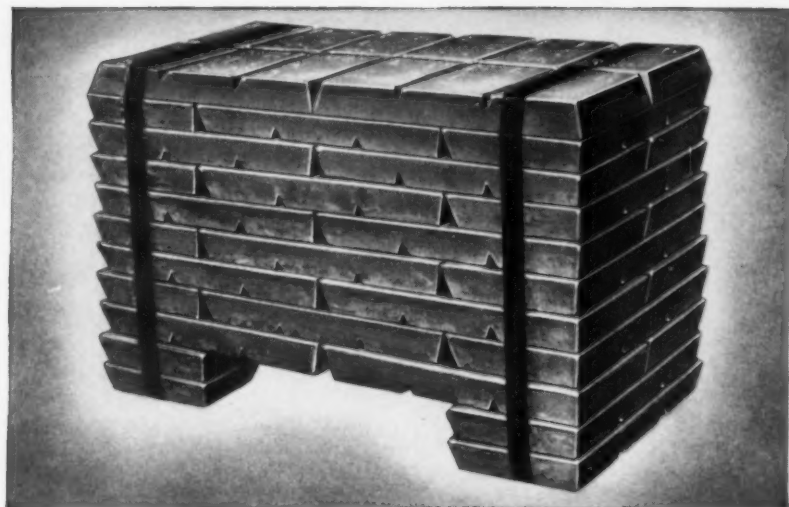


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# Die Casting Machines and Their Safe Operation

GEORGE MALACOS

**S**AFETY engineering as applied to the die casting process and related activities such as trimming and machining of castings, has progressed a long way in the fifty-odd years the process has been used as a production method. In the early days, when equipment was crude and safety regulations for protection of operators virtually non-existent, severe lost time accidents were, unfortunately, quite commonplace. Among the senior citizens of the die casting industry it is not uncommon to encounter lost fingers due to lack of protective shielding at the die opening, scars from burns caused by flashing metal, and other symptoms of the loose safety standards of the time.

In more recent years the manufacturers of equipment, managements of die casting plants and labor unions have all become very much aware of the hazardous nature of the operation unless adequate safeguards are designed into the equipment and comprehensive safety programs instituted and rigidly enforced.

Despite the considerable progress made since World War II, the period during which the die casting process has really come into its own as a mass production tool of industry, there is still much room for improvement in the safety area.

The following is a factual report of the safety experience at a middle-sized, modern die casting plant over a recent six-and-a-half-year period. The plant employed a total of 400 production workers in die casting, trimming and machining operations, 214 workers in the zinc department which had 20 automatic ladle hot chamber machines, 186 workers in the aluminum department with 18 hand ladle cold chamber machines. In the period of this study 14 lost time accidents, representing 13,260 days of lost time, were recorded. (Notes 1 and 2 at the end of the detailed report on lost time accidents describe the methods for calculating lost time.) Additionally, first aid was dispensed in approximately 9,000 instances for minor lacerations, abrasions, burns, etc. which did not result in lost time.

The reported accident experience shows that, no matter how carefully a safety program is conceived and executed, a margin often remains within which an employee can be injured, sometimes seriously. Therefore, it becomes doubly important for every conceiv-

able hazard to be covered by the program. It is hoped that the Lost Time Accident Reports will indicate some of the more glaring in-plant danger areas. The notes following these Reports are presented to guide the plant manager in the establishment of his own program.

Another outgrowth of this study was the conclusion that, despite variations in design detail for the several makes of die casting machines used, their hazards are essentially similar, and methods of prevention the same.

## LOST TIME ACCIDENT DETAILED REPORTS—ZINC

Employees—214  
Die Casting Machines—20  
Hours of Exposure—1,610,313  
Lost Time Accidents—4  
Lost Time—3,468 Days

### Case 1

Lost Time Accident—Zinc Die Cast

Age of injured employee—23 years old.

History:

On a zinc die cast machine, the pilot hydraulic valve stuck, causing the automatic plunger to squirt hot molten metal into the open die, striking operator. Hydraulic oil (non-inflammable type) in use is corrosive and caused the valve to stick. This could have been prevented by proper maintenance (cleaning of small rubber ring used to operate pilot valve).

Injury sustained: Burns to arm and shoulder.

Lost time: 18 days. (See Note 1)

### Case 2

Lost Time Accident—Zinc Trimming

Age of injured employee—28 years old.

History:

The injured employee, a job setter, was checking a 21½ ton trim press for complaint of "nicking castings," asking the operator to "hold it a minute," as he reached into the die without locking out the machine. It seems the operator hit the on button, causing the loss of the job setter's right hand at the wrist. Surgical amputation of the right hand at the wrist.

Injury sustained: Surgical amputation of the right hand at the wrist.

Lost time: 3,000 days. (See Note 2)

### Case 3

Lost Time Accident—Zinc Trimming

Age of injured employee—29 years old. (Continued on Page 14)

*Mr. Malacos is presently Safety Engineer at the Monroe Plant of the Metal Stamping Division of Ford Motor Company. At the time this report was written he held the same position at the Monroe Plant of Ford's Hardware and Accessories Division.*

History: While operating a 21½ ton trim press, and after having trimmed four of the eight castings, he turned the remaining parts in his hands to trim the balance and in turning, he placed his finger into the die.

Injury sustained: Surgical amputation of the distal phalanx—left index finger.

Lost time: 150 days. (See Note 2)

#### Case 4

Lost Time Accident—Zinc Die Cast

Age of injured employee—24 years old.

History: The injured employee had changed the goose-neck and nozzle on the zinc die cast machine. He was working behind the machine, and the machine operator was with him looking on. When the injured employee had the goose-neck and nozzle installed, he asked the operator to go around in front of the machine on the operator's side and close the die. The operator walked around the machine to the controls located in front of the machine, and at the same time the injured employee decided to double check the nozzle. He placed a pencil into the hole of the nozzle with his right hand to see if the hole was in line. At the same instant, the operator pushed the switch, closing the die on the injured employee's right hand.

Injury sustained: Surgical amputation of the second finger at the midpoint of the proximal phalanx—right hand.

Lost time: 300 days. (See Note 2)

### LOST TIME ACCIDENT DETAILED REPORTS— ALUMINUM

Employees—186  
Die Casting Machines—18  
Hours of Exposure—1,854,911  
Lost Time Accidents—10  
Lost Time—9,792 days

#### Case 1

Lost Time Accident—Aluminum Die Cast

Age of injured employee—25 years old.

History: In the course of his work, the injured employee rested his left hand on the core puller and as the die cast machine indexed, he caught his fourth finger, left hand, between the core puller and the spring core puller plate, resulting in a crushed finger.

Injury sustained: Surgical amputation at the distal phalanx—fourth finger, left hand.

Lost time: 150 days. (See Note 2)

#### Case 2

Lost Time Accident—Aluminum Machining

Age of injured employee—44 years old.

History: Injured employee left his department to get a drink of water at water fountain. After getting his drink, employee turned around to walk away and walked into the side of an industrial material handling lift truck.

Injury sustained: A fractured left leg and hip causing him to be hospitalized.

Lost time: 222 days. (See Note 1)

#### Case 3

Lost Time Accident—Aluminum Die Cast

Age of injured employee—27 years old.

History: The injured employee was experiencing hydraulic trouble with his aluminum die cast machine die. He notified the job setter of this, who in turn obtained hydraulic service from the hydraulic man. In trying out the machine

the injured employee made a shot, and in attempting to remove the casting, the machine closed, catching his glove and hand in the die.

Injury sustained: Traumatic amputation of the 1st, 2nd, 3rd and 4th fingers of the right hand at the proximal articulation.

Lost time: 1,800 days. (See Note 2)

#### Case 4

Lost Time Accident—Aluminum Die Cast

Age of injured employee—28 years old.

History: The injured employee was attempting to set up a die in a die cast machine. He placed the shot plunger shaft stem into the die and was adjusting the shaft to the plunger tip, when he stepped on the shot cylinder control switch located at floor level, catching his right hand between the plunger shaft stem and the threaded plunger tip.

Injury sustained: A crushing injury to the right hand, compound fracture, base of 1st metacarpal with extensive laceration of palm.

Lost time: 47 days. (See Note 1)

#### Case 5

Lost Time Accident—Aluminum Trimming

Age of injured employee—19 years old.

History: The injured employee was operating a 21½ ton trim press. He placed his left hand into the trim die to brush out chips or shavings from around the lower half of the left cavity of the die and pushed the right one-hand control with his right hand, pinching his left middle finger.

Injury sustained: Surgical amputation of the distal and mid-phalanx—left middle finger.

Lost time: 300 days. (See Note 2)

#### Case 6

Lost Time Accident—Aluminum Die Cast

Age of injured employee—25 years old.

History: While the injured employee was operating an aluminum die cast machine, the plunger caught in the sleeve and he put a piece of steel up into the sleeve to push the plunger back. When the plunger went back into play, he kicked out the piece of steel manually and had his hand in front of the sleeve to catch the piece of steel. The steel pinched his finger between the ejector half of die and the piece of steel.

Injury sustained: Surgical amputation of the distal portion of the middle phalanx of the right little finger.

Lost time: 150 days. (See Note 2)

#### Case 7

Lost Time Accident—Aluminum Machining

Age of injured employee—24 years old.

History: The injured employee, a set-up man, attempted to remove a wedged part with his right hand without shutting off the machine. As the part was removed, the machine cycled, catching the employee's right hand between the broach cutter and the locating pin.

Injury sustained: A traumatic amputation of the right hand at the wrist.

Lost time: 3,000 days. (See Note 2)

#### Case 8

Lost Time Accident—Aluminum Die Cast

Age of injured employee—28 years old.

History: The day shift job setter was attempting to check the length of the shot cylinder sleeve

of the aluminum die cast machine with a small scale rule, when the relieving job setter (injured employee), placed his right index finger into the hot metal chamber of the shot cylinder without shutting off the machine. The machine cycled, crushing his finger between the sleeve and the ram.

Injury sustained: A traumatic amputation of the right index finger, distal phalanx.

Lost time: 300 days. (See Note 2)

#### Case 9

Lost Time Accident—Aluminum (Storage Area)

Age of injured employee—44 years old.

History: The injured employee, a general foreman, and his first line foreman were attempting to check stock in the aluminum die cast storage area. They climbed the side of a stack of tubs, tiered three high (nine feet from the floor). The combined weight (approximately 365 lbs.) of both men caused the tubs to shift and the top tub to fall 6½ feet, pinning the injured employee between the tub and the cement floor.

Injury sustained: A fractured right leg and severe contusion left hip and pelvic region.

Lost time: 223 days. (See Note 1)

#### Case 10

Lost Time Accident—Aluminum Die Cast

Age of injured employee—44 years old.

History: The injured employee was operating an aluminum die cast machine, attempting to dislodge a stuck casting. Using his left hand and tong (pliers) and without shutting off machine, his rhythm of movement was interrupted by the lodged casting and this caused him to

push the die closing button by mistake with his right hand, closing the die.

Injury sustained: Surgical amputation of the left hand at the wrist.

Lost time: 3,600 days. (See Note 2)

#### NOTES:

1. Temporary total disability injuries which do not result in dismemberment are recorded under "Lost Time" in terms of the actual number of days the employee was hospitalized or otherwise delayed from returning to work.
2. Injuries leading to dismemberment and other permanent loss are recorded under "Lost Time" in accordance with the American Standard Method of Recording and Measuring Work Injury Experience, as published by the American Standards Association.

#### SUGGESTED ACCIDENT PREVENTION PROGRAM

##### Layout of Department

Many accident hazards can be eliminated by careful planning well in advance of actual installation, by location of machines and related services. When the volume of production warrants the expense, belt conveyors are a safe and economical method of moving the casting from the machine to the trimming department.

##### Lighting

Good lighting is essential to good operation. The die must be clearly visible to the operator if he is to see that it is free of all small pieces of flash which may prevent the die from fully closing.

Oil and smoke make it difficult to keep lighting fixtures clean when they are installed close to the machine. A recommended practice is to install adjustable spot lights overhead and to one side of the machine in

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such a way that the glare does not strike the eyes of the operator but does illuminate the die. So that employees may not trip over castings or other objects, general room lighting should be strong enough to make all parts of the floor visible.

#### **Ventilation**

To insure good ventilation every effort should be made to locate die casting machines in a high-roofed building, preferably with the saw tooth or monitor type of roof. The smoke and heat created by the operation of the machines will thus be more readily dissipated. Fresh air brought into the work room by the use of fans and ducts, with outlets located at each machine, will improve working and health conditions where high roofs are not available.

#### **Die Storage**

Because of the weight and value of the dies, adequate handling and storage facilities should be provided. A strongly built rack with roller shelves slanted towards the back will make handling both efficient and safe. An elevating platform truck will reduce the danger of injury when dies are moved to and from the rack.

#### **Piping System**

When several machines are grouped together and fed by large central hydraulic pumps or set individually as self-contained units, care should be used in the selection of pipes and fittings to insure a safe carrying capacity for the pressure used.

It is recommended that high pressure piping be in-

stalled in accordance with the code for pressure piping approved by the American Standards Association. It is safer to bend and weld the piping, using flanges, than threaded fittings for connections. This method eliminates leaks of hydraulic fluid or oil, except possibly for an occasional one at the flanges, at which location repair work is simple. Bending and welding reduces the risk of employees receiving serious burns from oil under high pressure spurting from a leak or a split pipe and igniting on clothing. This method would apply more where oil is used instead of water or non-inflammable hydraulic oil.

Where additional pressure is required, nitrogen gas is introduced through the top of the tank by means of an accumulator tank. Only thoroughly qualified personnel should be allowed to do such work. Oxygen must never be used for this purpose, as oil may be ignited and burn with explosive violence if oxygen under high pressure comes into contact with it. In a die casting plant care must be taken to control the use of oxygen tanks and their storage.

#### **Molten Metal**

Supplying the machines with molten metal is a hazardous operation unless certain precautions are taken. Whenever it is possible to do so, an overhead hoist system on a track with a safe method of switching should be used to transport the molten metal from the melting furnaces to the machines or holding furnaces, thus eliminating hot metal splashes which might occur from trucks moving over uneven spots in the floor.

However, under no circumstances should the hot metal be carried over the heads of workmen. The hoist and the pot carrying the metal should be inspected daily and, if found defective, they should be taken out of service. The workman should be provided with a longhandled ladle and should be instructed to slide it slowly into the pot sideways.

Cold metal, either scrap or pig, should be pre-heated to remove all moisture before being added to a pot of molten metal, thus reducing the possibility of explosion.

#### **Splash Shields**

Splash shields should be set at each machine and around the die itself to deflect hot metal that may spurt from the die should the die not close tightly. The machine shields should be about seven feet high and four feet wide, with three-inch angle sides. The sheet metal shield should be covered with one-quarter inch wire mesh that will catch the metal, preventing it from glancing off the shield. To prevent its being moved and to facilitate floor cleaning, it is better to hang the shield from an overhead support. Splash metal collected on the shield or overhead should be removed to prevent injury to men below.

#### **Personal Protective Equipment**

Personal protective equipment should be worn by all employees near the machines, whether they are operators or not. The wearing of eye protection with side shields or face protection, gloves, long sleeves or

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arm protectors and safety shoes and leggings or spats should be a strict rule of the department, and supervision should see that the rule is observed. To reduce skin irritation and the hazard of burns, oil-soaked clothing should be replaced with clean clothes as frequently as required.

#### **Machine Operation**

When one operator replaces another on a machine that has been operating, it is customary to pass on to him such unusual information about the job as sticking cores, die lubrication requirements, or failure of the die to make perfect castings. A small bulletin board or a log sheet with each machine may be used for this purpose, if written instructions are desired. Operation of the machine will vary with the job being run. On some jobs it functions almost automatically.

The operator, however, must be alert to avoid injury when he removes the hot casting from the machine and when he blows out the die with the air hose and lubricates it. Jobs often require the operator to perform some hand operations for each shot. Extra precautions must be taken if injuries are to be avoided.

It is recommended to have a sliding door installed for control of splashing metal. Where use of core pulls prevents installation of protective sliding doors, a two-hand trip installation is recommended so that the operator must use both hands to close the machine. Tripping levers should be located safely back of the die, thus removing the operator from the danger zone (parting line of die). On machines requiring the operator to hand fill the metal well for each shot it is advisable to have the melting pot immediately adjacent to the machine. A ladle in good condition should be provided, as well as a clean, clear work space and an even floor.

In the selection of die cast machine operators, proven employees should be used over new hires.

#### **Maintenance**

The maintenance of die-casting machines is especially important because of the high pressure required in their operation. All working parts are under severe strain and fractures are not uncommon. The piston rod, cylinder, rings and packing should be kept in perfect condition. Any defect in them should be repaired at once. The cams and toggles used for closing the die

must be kept correctly adjusted and well lubricated. All piping should be checked for leaking joints and when such are found, they should be repaired immediately.

Air pressure on hoses used for blowing out the die should be kept as low as possible by using a pressure regulator which, if sealed, will prevent tampering. Excessive pressure adds to the hazard of injury from flying pieces of metal. Air hoses, supply lines and nozzles should be of a type which will not fly apart easily.

It may be necessary on some types of machines to build a solid platform which will enable the operator to reach safely all parts of the die but not the complete length of the machine. The platform should be built of heavy material to assure that it will not tip over. It must be kept in good repair, as a loose or broken platform may cause the operator to fall into the machine.

A simple set of safety rules should be provided to die-casting machine operators, die setters and maintenance workers.

#### **Die Setting**

Risk to workmen setting the dies can be reduced by the use of an overhead hoist or crane, the use of proper tools and good supervision. Some companies detail experienced die setters to this work, with the machine operator assisting. Regardless of the die setter's experience, when the first shot is made, the area around the machine should be cleared of all workers. In addition to the hazard of setting the die, there is a chance that molten metal will spurt out should the die not close tightly.

To guard against injury from this source, replace the sheet metal guard that guards the die parting line or install an enclosure to operate with the movement of the die. The die should be freed of moisture, preferably by pre-heating.

#### **SUGGESTED LIST OF PLANT SAFETY RULES**

##### **Safe Machine Operation**

1. Wear eye protection with side shields (in some cases, face shields) at all times in the department (all employees).
2. Wear heat-insulated gloves (24 ounce canvas gloves).
3. Keep sleeves rolled down, shirt closed at the neck.
4. Step back of the die when making the shot.

(Continued on Page 20)

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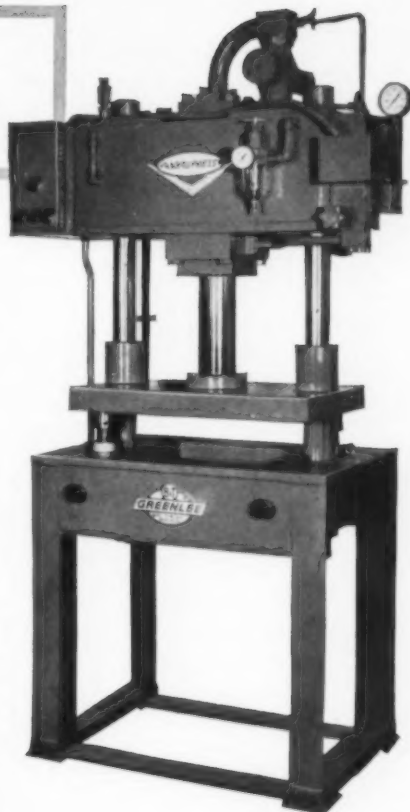
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5. Never clean or lubricate the die by hand. Use the air hose, or a brush.
6. Don't neglect burns, not even small ones.
7. If your machine is out of order, report it at once.
8. When you can, use tongs to remove castings.
9. Keep your machines and floor around the machine clear.
10. Never attempt to clean, oil, adjust or repair a machine while in motion. (Padlock machine at main switch.)

#### Safe Machine Maintenance

1. Padlock out machine before setting die, cleaning, oiling, adjusting or repairing.
2. Replace all guards that have been removed.  
NOTE: The machines are not ready to run until all guards have been re-installed.
3. All valves to be set by hydraulic men only.
4. Use only non-inflammable hydraulic oil.
5. Nitrogen bottles to be changed by instructed hydraulic men only.
6. Before turning over machine to production, all debris resulting from repair work should be removed by the maintenance crew when work is finished. (This will promote good housekeeping.)

#### SUMMARY

After extensive study and observation the following SAFETY thinking is found to be of importance for proper control of situations which could lead to accidents:

##### I. Controlling the Mechanical Element

- a. Where practical, two hand controls are recommended for the operation of all trim presses and die casting machines and all other machines used for producing this type of product, such as multiple drilling and tapping machines.
- b. Electrical type safety blocks are recommended for use

on all trim presses and to conform with the die opening for proper placement.

- c. Proper control is recommended for all mechanical guards provided, these guards to be in place at all times.
- d. Institution of carefully planned preventive maintenance and housekeeping programs is recommended.
- e. The use of sheet metal sliding doors is recommended for all types of die-casting machines and in the case of core pullers, the use of two button controls.

##### II. Controlling the Human Element

- a. Strict enforcement of safe practice, padlocking out the main electrical switch, when setting dies, cleaning, oiling, adjusting or repairing all machines and equipment.
- b. A complete and strictly enforced personal protective equipment program, such as eye protection with side shields, face shields when pouring or melting metal, proper gloves, tongs, safety shoes, leggings, etc.
- c. A program is recommended to fully train responsible supervisors in controlling the behavior of the work force, with special emphasis on the prevention of employees working at an unsafe speed.
- d. Complete and enforced safety instructions to all new and transferred employees, prior and after starting work, is recommended. (Every first line foreman should spend at least five minutes each day on safety instructions with his people.)

#### DAVID TANN CHAIRMAN OF SECOND NATIONAL EXPOSITION AND CONGRESS

THE National Directors of the Society have announced that David Tann, President of Tann Corporation, has been named Chairman of the Second National Die Casting Exposition and Congress, to be sponsored by the Society in Detroit's Cobo Hall, September 25-28, 1962.



Mr. Tann will direct all activities of the Exposition, which will have a 40,000 square foot exhibition area to accommodate approximately 150 exhibitors.

He will also head the planning for the Technical Congress, held in conjunction with the Exposition, which will feature technical papers presented by experts on die casting processes and applications from all over the world.

An attendance of 10,000 die casters, engineers, purchasing executives and metal working plant executives concerned with die casting production is expected for the four-day Exposition.

Mr. Tann is a 1931 mechanical engineering graduate of the University of Michigan. He joined Tann Corporation, which has headquarter offices at 3750 East Outer Drive in Detroit, immediately following graduation.

On January 1, 1961 he was named president of the corporation. In his present position, Mr. Tann directs the activities of the Tann Corporation's five Divisions: the Congress Die Casting Division, the Congress Drives Division, the Congress Tool and Die Division, the Tann Bearing Division, and the Tann Controls Division.

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- 1 LAKE ERIE, 350 ton, Zinc, 1954
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We have many more.—All have been conscientiously rebuilt, and are guaranteed during first 30 days of actual production in your plant, but within 90 days after shipping date.

- 2 Lindberg Dual Chamber 30 KW. 220 Volts Induction Melting Furnaces and one ditto, 440 Volts. Factory rebuilt like new.
- 1 Lindberg Dual Chamber 40 KW. 220 Volts Induction Melting Furnaces
- 1 Lindberg Dual Chamber 40 KW. 220 or 440 Volts, less Controls (Spare Furnace)
- 1 Lindberg Dual Chamber 60 KW. 440 Volts Induction Furnace complete.
- 3 Stromen Dual Hearth reverbs 1000 lbs. Cap. 1959

We have Pot Furnaces for Alum. Zinc and Magnesium, plain and tilting in all sizes up to 2000 lbs.

All above equipment will give new performance at less than half new cost. Part financing arranged if desired.

### DIECASTERS' EQUIPMENT DIVISION MAGNESIUM INDUSTRIES INC.

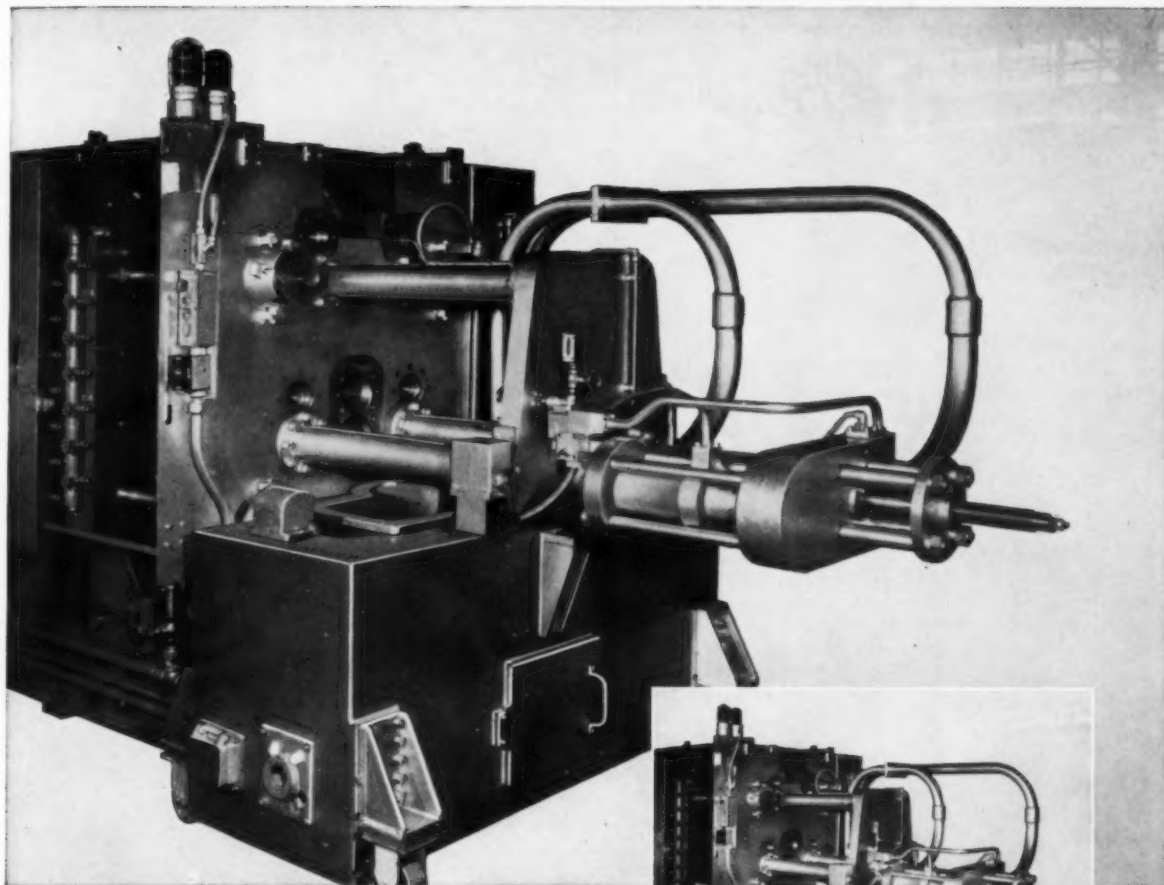
1313 Kalamazoo Street  
South Haven, Mich.

Tel. 1163 (Evenings 674)

Ask for Hoagy Lawson

CIRCLE 17 READERS SERVICE CARD





# CAST-MASTER

**builds what the  
die caster needs**

Backed by a program that is "customer-controlled", Cast-Master consistently strives to improve its machines. The latest in a long list of modifications, through the years, are illustrated. They include:

- New 4-strain rod design provides better, more accurate plunger alignment.
- High pressure lines relocated—permit furnace to be used under injection cylinder (see small photo). Removes hydraulic lines from furnace heat. (Special piping arrangements upon request.)
- Simplified hydraulic circuit features subplate mounted valves, less pipe and tubing.
- Cast-Master shot intensifier system operates without valves. Instant intensification of injection pressure improves casting quality—gives smoother finishes, decreases porosity.
- Slow shot principle delays high speed injection plunger till after plunger passes metal pouring opening. (Eliminates splash.)
- Injection assembly is infinitely adjustable from minimum to maximum injection speed.

Compact efficiency made possible with redesigned injection end is illustrated. Injection and intensifier cylinders are side by side; high pressure piping is shown to rear of cylinders. Furnace rolls under injection assembly—out of the way and close to work station.

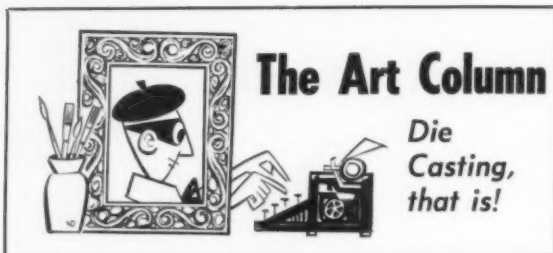
New convenience, new efficiency is illustrated in view with furnace removed. Cast-Master builds what the customer wants!

H-P-M DIVISION — KOEHRING COMPANY

# CAST-MASTER

MOUNT GILEAD, OHIO, U.S.A.

CIRCLE 18 READERS SERVICE CARD



By **EARLE W. REARWIN**

**T**HERE are many facets to the art of die casting. There are eighteen well-defined variables in this so-called "art," but the one that is all too frequently overlooked is the condition of the metal prior to casting. The metal, whether it be zinc, aluminum or magnesium, must be carefully and properly alloyed, melted and fluxed before injection into the die cavity, in order for art to produce an acceptable casting. There is no state of art that can produce a casting any better than the metal injected into the die. While certain arts sometimes practiced in the die casting cycle can seriously damage or destroy good metal, no art or magic performed in the gooseneck or the cold chamber of the die casting machine can improve upon the metal as it passes through.

A recent examination of a zinc operation revealed several things. First, sixteen pounds of stray material were removed from the holding pot. This material consisted of brass, copper and steel inserts, cadmium plated screws and other partially melted debris. The surface of the pot had a good three inches of froth riding above the zinc. The castings were supposed to be pressure tight but showed an alarming frequency of leakers. Also, many of the castings were plated, and the plate was rough. There were white specks showing through the plate in many areas of the castings, making them unacceptable.

A further examination of this operation revealed that all of the rejected castings, even those plated or painted, were fed directly back into the machine pot. Much of the residue removed from the bottom of the pot was sludge, a later examination of which revealed the cause to be contamination from paint. Many of the scrap castings fed back into the pot had been partially assembled, the assembly including a neoprene washer and phenolic resin spacer. The result was, of course, a charred residue which fouled the melt. One of the assemblies was painted with a silicone paint. Many of these parts were fed back directly into

the pot after scrap had occurred in the painting operation.

The first correction made was complete cleaning of the pot and gooseneck. All of the old metal was removed and wiped out. The pot was charged with new alloy and brought up to the pouring temperature. However, it was discovered that the pyrometer was 170° off, and that the metal was being cast at an actual temperature of over 1000° F. Adjustments were made and the metal was brought down to a normal casting temperature. The resultant castings were of high quality, the type normally expected from good grade zinc. They neither leaked nor gave any trouble in the plating operation. They took a good plate. The management of this plant was convinced of the value of proper metal control.

(Continued on Page 28)

## CLIFFORD-ROCKWELL COMPANY

### METAL FINISHING MATERIALS

19362 JAMES COUZENS HWY.

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Diamond 1-6360

### COMPOSITION MATERIALS CO., INC.

Crushed walnut shells, corn cobs, high grade sawdust and leather fibers for blasting, tumbling, metal finishing.

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Producers of the finest mounted points and wheels for deburring and die barbing.

### HERMES ABRASIVES DIVISION

United Mineral & Chemical Corp.

A complete line of belts, sheets, rolls and discs on cloth, paper and fiber backings.

### AUTO-DIESEL PISTON RING CO.

Plunger rings in stainless steel, hard steel, and cast iron in any size. Rings of steel and beryllium copper for cold chamber tips.

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Swiss files for die makers made to precision standards here in the U. S.

CIRCLE 19 READERS SERVICE CARD

# REBMAN PRODUCTS CORPORATION

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Plastic Molds

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CIRCLE 20 READERS SERVICE CARD

## DCE LETTERS

### Numbering Wheels

Do you know anyone in the die casting field who makes numbering wheels? We would like to locate someone who has a basic die for casting the wheels in zinc—with both ten and twelve numbers on the periphery—diameter approximately  $\frac{3}{4}$  inch.

We can, if necessary, make them ourselves, but it seems foolish to go to all that expense if someone is already producing them.—C. C. A.

### Dial Feeds

Please inform machine and tool manufacturers of our interest in punch, hydraulic and air presses which incorporate a rotary dial feed mechanism. Sizes from several-ton up to approximately forty-ton would be of interest.

We are also interested in rotary tables, rotary feeds and miscellaneous dial feeds of all types that can be incorporated into standard machines.—S. C. W.

*DCE would appreciate hearing*

*from readers who can provide these two writers with the information they seek.*

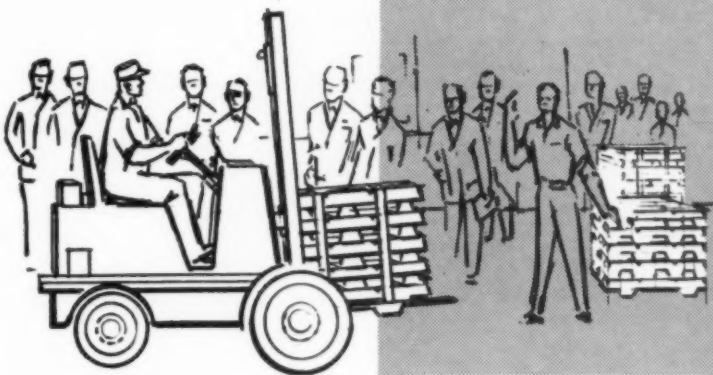
### Steel Die Casting

Reference is made to the article, "Developments in the Pressure Die Casting of Steel" in the July issue of the *Die Casting Engineer*.

This piece proved of great interest to the writer and he is desirous

of knowing if we have people in the United States who are producing die castings of steel or having a research or experimental program along these lines—D. B. C.

*As far as DCE knows, there is no company making or even researching steel die castings. If any reader has different information, we should be anxious to hear from him.*



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Designers & Builders

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**DIE CAST DIES  
PERMANENT MOLDS  
SPECIAL MACHINES**

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CIRCLE 21 READERS SERVICE CARD  
September, 1961

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You don't need big-company equipment to get palletized service from HB&S. Our delivery trucks not only have hydraulic tailgates to drop the palletized material to sidewalk level, but also carry along a small hand-operated hydraulic lift-truck to roll the material to any point within your plant!

HB&S service is personalized to fit your needs just as HB&S alloys are specifically engineered, quality-controlled from start to finish, to meet your casting needs.

See what a difference HB&S service . . . HB&S quality make in better casting results . . . lower costs.

Write NOW for this FREE reference book and guide to help you in selecting your die castings alloys. It's loaded with FACTS.

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CIRCLE 22 READERS SERVICE CARD

Famous names  
that identify the finest in  
**Die Casting and  
Mold Steels** for  
today's production demands

## Hotform

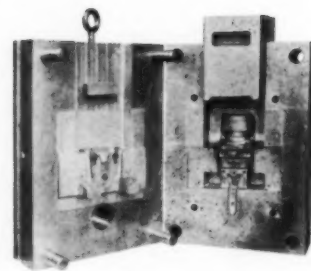
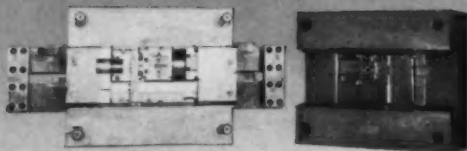
The most widely used hot work die steel—developed originally for aluminum die casting with high resistance to erosion and heat checking. Very resistant to thermal shock, and will withstand working temperatures up to 1000°F.

## Speed-Cut

A high quality, free machining steel for the die casting of white metal alloys, plastic mold plates and parts. Machines readily at 275 to 325 Brinell. Available annealed or pretreated.

# MC

Mold and cavity steel specially developed to permit high surface finishes in die casting dies and plastic mold cavities. Also used for mold plates and parts. Furnished annealed or pretreated to 275 to 325 Brinell. Pretreated MC is uniformly hard throughout sections as large as 20" x 10".



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**DIE CAST**  
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# Belleville Die Shop, Inc.

Designers and Builders of

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For over 21 Years

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Pocket Milling Specialists in  
Mold Bases and Cavity  
Retainer Sets

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ROMULUS, MICHIGAN

CIRCLE 25 READERS SERVICE CARD

September, 1961

# INDUSTRY NEWS

## NATIONAL LEAD

Alfred F. Bauer, formerly Assistant General Manager of the Doehler-Jarvis Division of National Lead Company, has recently been named Manager of that Division. National Lead also announces the beginning of production at a new die casting plant at Boulogne, Argentina, a suburb of Buenos Aires. This is National Lead's third overseas die casting facility, the others being located at Sao Paulo, Brazil and Worcester, England.

## CLINTON ENGINES

Clinton Engines Corporation, Clinton, Michigan, has announced a new aluminum die casting alloy named "Alumalloy," which, when used in conjunction with refined die casting techniques, greatly alleviates porosity problems in die cast aluminum air-cooled engine components.

## HEVI-DUTY ELECTRIC

Hevi-Duty Electric Company has made the first installation at Sibley Machine and Foundry Company, South Bend, Indiana, of a new line of low frequency induction melting and holding furnaces, which they will manufacture under license with Tagliaferri of Milan, Italy. The line uses a new technique for applying induction melting principles, a "controlled stirring action," with results which are said to have advantages for the aluminum die caster.

## D-M-E

D-M-E Corporation, (formerly Detroit Mold Engineering Company), important Midwest supplier of die casting and injection molding tooling and accessories, has been acquired by Voi-Shan Industries, Inc., Los Angeles, California. Other acquisitions by Voi-Shan are American Mold Engineering Company, Charlevoix, Michigan, and Mount Clemens Manufacturing Company, Mt. Clemens, Michigan.

(Continued on Page 26)

## THIS TRIGGER



Get more usable castings with the **P-W SYSTEM**—universally accepted throughout the die casting industry.

GUN UNITS AVAILABLE SEPARATELY

Write for additional information to

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# MEYER ENGINEERING COMPANY

Designers of:

Die Cast Dies since 1938

Plastic Injection Molds

Progressive Dies

Special Machines, etc.

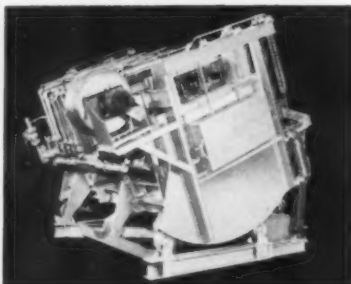
Contact Art Gronkowski  
19229 Mt. Elliott Ave.  
Detroit 34, Michigan  
'Phone: TWinbrook 1-6300

CIRCLE 27 READERS SERVICE CARD



Kozma Melting and Holding Furnaces are being specified by die casters, permanent molders and aluminum producers . . . where highest quality metal is a "must."

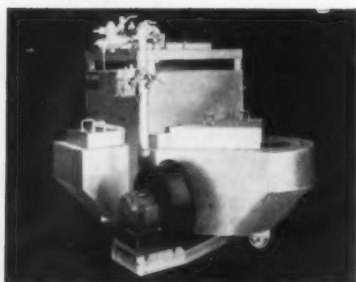
### ▼ TILT-TYPE MELTING FURNACE



These new Kozma Furnaces for aluminum or magnesium melting combine all the advantages of Kozma exclusives . . . Radiant-Panel firing, "Pre-Temp" hearth or flue, a special re-melt well, and functional tilting design. Integral ladle suspension arms permit easy ladle removal.

Kozma Tilt-Type Furnaces provide faster melting rate, highest possible metal purity, increased fuel economy, lower melting costs. Capacities from 600 to 2,000 lbs. per hour.

### HOLDING FURNACE ▼



Kozma Model RH Holding Furnaces are designed for use in die casting and permanent molding. Roller bearing wheels and a unique dipwell permit integral installation. Both capacities and dipwells can be designed to meet your particular requirements.

Write today for complete information!



CIRCLE 28 READERS SERVICE CARD

## INDUSTRY NEWS

### ROSSBOROUGH SUPPLY

Wm. F. Joseph has been named Technical Director of Rossborough Supply Company, manufacturers of non-ferrous foundry and steel mill products. He will be responsible for completing development of several products for the non-ferrous foundry industry and will be available for customer technical service.

Mr. Joseph, for eighteen years Plant Metallurgist of Precision Castings Company, has been active in the American Foundry Society, the Die Casting Research Foundation of the American Die Casting Institute, The Society of Die Casting Engineers, the A.S.T.M. and the A.S.M.

### AJAX MAGNETHERMIC

Congratulations are in order to D. H. Naffzinger, chairman of the Indiana chapter, who is leaving Delco-Remy to take a sales position with Ajax Magnethermic Corp. Naff's headquarters will be in Trenton, N.J. Earl Bryant, Guide Lamp, will assume the chairmanship of Chapter No. 25.

### ROSSBOROUGH SUPPLY DIE CAST PRODUCTS

Wm. Joseph and Richard Gleason have left the Precision Castings Company to take positions at the Rossborough Supply Company and the Die Cast Products Corp. respectively, both in Cleveland.

### CALDWELL CASTING

Richard Oster, formerly with the Dollin Corp., is now with Caldwell Casting Corp., Cambridge, Maryland, according to a report from New York.

### AALLIED DIE CASTING

Connie Zwik, Aallied Die Casting, Franklin Park, Ill., has made a new addition to his plant, doubling the floor space.

### DU PAGE

Du Page Die Casting Co. has re-located in a new modern building in Niles, Illinois, where they will continue to make quality zinc and aluminum castings.

## SDCE SUPPORTING COMPANY MEMBERS

### SUSTAINING MEMBERS

American Mold Engineering Co.  
Atols Tool & Mold Corp.  
Cast-Master, Incorporated  
Chrysler Casting Plant, Chrysler Corporation  
Clinton Engines Corp.  
Congress Die Casting Division, The Tann Corp.  
Crucible Steel Company of America  
Cuyahoga Industries  
Double A Products Company  
J. R. Elkins, Inc.  
Metal Castings & Cold Forming Division,  
General Motors Corporation  
Process Development Section,  
General Motors Corporation  
Kux Machine Co.  
Latrobe Steel Company  
Lester Engineering Co.  
Michigan Standard Alloys, Inc.  
Permanent Mold Die Co., Inc.  
Reed-Prentice Division, Package Machinery Co.  
Universal Die Casting Division,  
Hoover Ball & Bearing Co.

### COMPANY MEMBERS

Alignment Engineering Co.  
All State Industries, Inc.  
Atlantic Chemicals & Metals Co.  
B & K Tool Co.  
B & T Machinery Company  
Briggs & Stratton Corp.  
Central Die Casting & Mfg. Co., Inc.  
Crucible Steel Company of America  
Dodge Steel Company  
Donald Carrol Metals, Inc.  
H. Cohn & Sons  
Columbia Engineering Co.  
Conneaut Die Casting Co.  
Detroit Mold Engineering Co.  
Disdie Steel, Incorporated  
Dominion Die Casting Ltd.  
Dart Manufacturing Co.  
Formax Mfg. Corp.  
Johnson Motors, Outboard Marine Div.  
Gasser Engineering Co.  
Grand Rapids Die Casting Co.  
Grand Mfg. & Steel Corp.  
Hall Steel Co.  
Hamilton Broach & Gage Company  
Henning Bros. & Smith, Inc.  
Holland Die Casting Co., Inc.  
E. F. Houghton & Co.  
Interstate Engineering Corporation de Puerto Rico  
Irrigation Equipment Co., Inc.  
Lake Erie Engineering Co.  
R. Lavin & Sons, Inc.  
Lindberg Engineering Co.  
Lindberg Steel Treating Co.  
Martin Grinding & Machine Works, Inc.  
North American Smelting Company  
Northern Tool & Die Co.  
Prospect Die & Mold, Inc.  
Quad-City Die Casting Co.  
Rapid Die & Engineering, Inc.  
Roth Smelting Company  
Frederic B. Stevens, Inc.  
Universal Cyclops Steel Corp.  
Hawthorne Works, Western Electric Co.  
Wabash Smelting Inc.  
Western Electric Co., Inc. (Baltimore)  
Western Electric (Chicago)  
Wico Electric Co.  
Charles Zapf & Co.

Die Casting Engineer

# CHAPTER NEWS

## CHICAGO

**5** Seventy eight members and guests attended the Annual Golf Outing in August, where everyone reported having a great day. Connie Zwik carried off golf honors with a score in the low 70's, and for the second straight year Clarence Fostle, after a year's serious practice, was again high man.

—D. V. Pomponio,  
Chapter Correspondent

## CLEVELAND

**6** The Annual Clambake was held at Legion Acres, Parma Heights, on September 23. Over 100 die casters and guests took part in the sports, fun and festivities. The climax of the day was the clambake with all the trimmings.

—Ed. J. Hinkel,  
Secretary

## NEW YORK

**7** Chapter 7 began the new year on September 27, when over 60 members and guests met at the Governor Clinton Hotel in New York to hear Mr. William Torkington deliver a fine talk on "Die Lubricants."

—George F. Fey,  
Chapter Chairman

## NORTH CAROLINA

**15** Mr. Joseph R. Elkins of J. R. Elkins, Inc. addressed the North Carolina chapter's September meeting. His topic was SDCE organization. The meeting was held on Thursday, September 28th at Schrafts Restaurant in High Point. Chapter Chairman John Weber has appointed Dick Hallwood as membership chairman.

## INDIANA

**25** The first Annual Summer Outing of the Indiana Chapter was held at the Idlewild Country Club, Pendleton, on Saturday, July 22. While the golf scores ranged from the sublime to the ridiculous, it was an enjoyable day for all. The 19th hole offered a pleasant interlude before dinner,



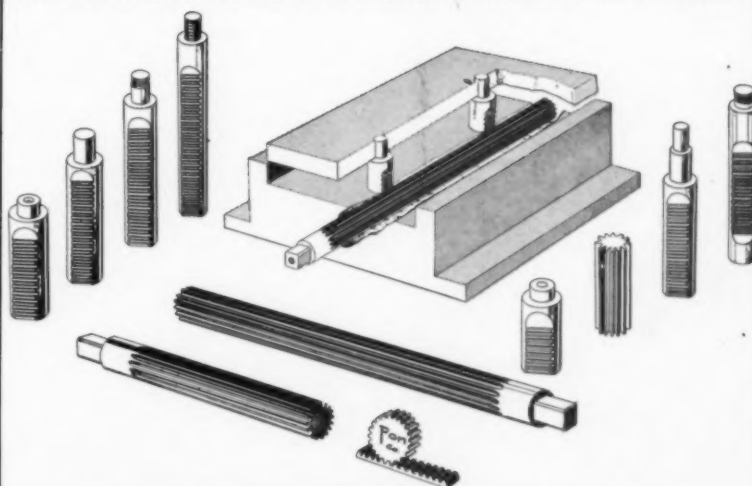
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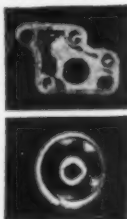


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flows freely  
to give good  
coverage.
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provides extra  
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protection.
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and will not  
settle. No need  
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can be applied  
with brush, swab  
or automatic  
lubrication.



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and technical data

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CIRCLE 30 READERS SERVICE CARD

## FOR SALE DIE CASTING MACHINES COMPLETELY REBUILT—GUARANTEED

- 1 KUX BH30 — 400 Ton 1950 — Alum. 17 3/4" x 31" between bars
- 1 KUX BHC30 — 400 Ton 1950 — Conv. 17 3/4" x 31" between bars
- 1 LESTER MHP-3X-S 600 Ton 1954 Aluminum — Core Pulls
- 1 CLEVELAND 80 Ton — 1950 Zinc — Elec. Automatic Core Pull
- 1 KUX HP 4012503 — 800 Ton — Alum. — 1950
- 1 REED 1 1/2 G — 200 Ton — Zinc

These machines have been completely rebuilt like new and are guaranteed for a full 90 day period against any defective part or workmanship. This guarantee is offered in writing and backed by us as a licensed and registered manufacturer.

- 2 LESTER HP — 2 1/2 x — SF — 400 Ton Alum.
- 1 CLEVELAND 400 Ton — 1950 Aluminum
- 1 LAKE ERIE — AH60 — 600 Ton Alum. — 1954. Like New
- 1 CASTMASTER — 500 Ton Aluminum
- 1 CLEVELAND 400 ton 1945 Alum.
- 1 KUX BH18 — 400 Ton — Zinc
- 1 KUX HP-25 — 400 Ton Alum.
- 1 KUX BH-60 800 Ton Aluminum

## BUDGET SPECIALS

The following are machines not rebuilt but in excellent condition that can be bought for a fraction of their original cost.

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| 1 LIGHT METAL — 60 Ton — Zinc — Like new | \$ 950.00 |
| 1 DCMT IMP-96 — 20 Ton — Zinc, Excellent | 1300.00   |
| 1 DCMT M55A — 12 Ton — Zinc, Brand New   | 1100.00   |
| 2 LAKE ERIE — 250 Ton — 1947 Zinc        | 2950.00   |
| 1 KENCO #2 250 Ton — Zinc                | 3250.00   |
| 2 KUX — 300 Ton — BH18 — 1948 — Zinc     | 2950.00   |
| 1 KUX — 300 Ton — BH18 — Zinc            | 3500.00   |
| 1 REED PRENTICE 1 1/2 G — 200 Ton — Zinc | 2900.00   |
| 1 ABC M1556 — Zinc — Brand New           | 2700.00   |

We are the only manufacturers of New Die Casting Machinery in the country specializing in Rebuilding Used Machines and use our engineering and skill into rebuilding these listed die casting machines. Your guarantee of satisfaction is valuable only because they have been rebuilt by Original Equipment Manufacturers.

Our prices are the lowest in the country and profits held to a minimum because we are not dependent on these trade-in machines for our main source of revenue.

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CIRCLE 31 READERS SERVICE CARD

when prizes were distributed.

### WESTERN ELECTRIC PLANT TOUR

Through the courtesy of the Western Electric Co., of Indianapolis, 61 members of the Indiana chapter were treated to a tour of the plant and die casting facilities on September 14.

Following a buffet dinner in the dining room, members of the Western Electric engineering department acted as guides for small parties of the group. In addition to the die casting department, where there are 14 machines ranging from 500 tons to a small one turning out 2300-2500 shots per hour, the SDCE members visited the finishing department, the new plastic molding area and the final assembly.

By way of statistics it is interesting to note that Western Electric uses about 10,000,000 lbs. of Zamac 3 and produces about 58 million castings per year. Over 130 people are directly involved in die casting. Western Electric is the largest user of plastic materials and has the largest molding operation in the

world, with 196 machines in use.

The Indianapolis plant occupies 133 acres with over 40 acres under roof. There are 7,000 employees here, and the 130,000 employees in the Western Electric system turn out 8 million telephones a year.

The Indiana chapter is indebted to Larry Daum of Western Electric for arranging the tour.

## Art Column

(Continued from Page 22)

Zinc should be melted and held at a uniform temperature. Inclusion of foreign or stray materials in the melt should be avoided. If it is necessary to remelt scrap, the operation should be performed in a pot separate and apart from the machine, and as much foreign material as possible should be removed by fluxing.

Art alone cannot remove from zinc silicone picked up from painted scrap. As a matter of fact, there is no known way of making this separation in the pot. Similarly, art alone will not remove carbon and other contaminants that scrap can carry into the pot. Therefore the art of good casting should avoid introducing these stray elements into the casting machine pot in the first place.

The caster is usually very careful to purchase the best quality zinc available. This zinc is produced and sold under a number of closely controlled specifications, but then the caster, using certain art, adds everything in the plant to it, deteriorating it to the point where it is little better than junk yard scrap. He stores it in areas where it is subjected to chemical corrosion. Often he stores his zinc together with paints, cleaning compounds and lubricants, permitting these contaminating materials to spill over the ingot. Then he simply takes the ingot and plunges it into the molten bath of the casting machine's pot without making any earlier effort at cleaning by wiping or heating. The chemicals rise to the surface and over a period of time cause froth. When the metal level in the pot gets low, this froth is often sucked into the gooseneck, and a very inferior grade of casting results. Under these conditions it is impossible to make zinc die castings which will be leak-proof and accept a good plate.

Perhaps the caster should practice a different kind of art in the



# DIE CASTING ENGINEER

SEPTEMBER, 1961

Expires 10/15/61

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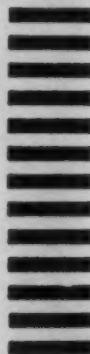
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### PRESIDENT'S REPORT

(Continued from Page 4)

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